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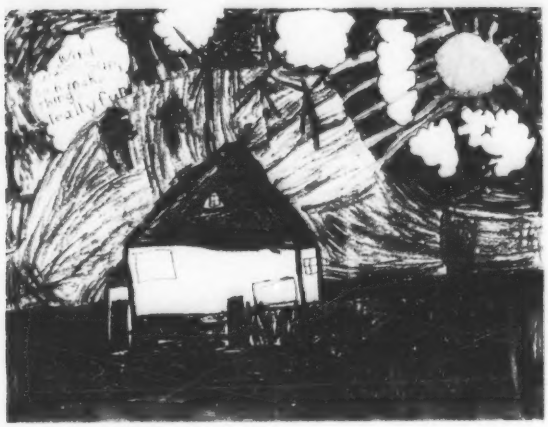

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Canadian Cataloguing in Publication Data
British Columbia
British Columbia VCR action plan 2000

ISBN 0-7726-44187

1. Greenhouse gases – Government policy - British Columbia. 2. Air quality management - British Columbia. I. Title.
II. Title: British Columbia Voluntary Challenge and Registry action plan.

TD885.5.G73B742 2000 363.738'7456'09711 C00-960373-5

COVER PHOTO ACKNOWLEDGEMENTS

Drawing of alternative energy home by student at Campus View Elementary School, Victoria. Courtesy of Ministry of Environment, Lands and Parks.

Surrey Central Station linking SkyTrain with bus network. Courtesy of BC Transit.

Two student participants in B.E.S.T. Off Ramp trip reduction program that encourages use of alternative transportation to school. Courtesy of Better Environmentally Sound Transportation.

Vancouver Telus Building before and after retrofit with high-tech skin and operable windows. Courtesy of BC Buildings Corporation.

Flame from natural gas stove. Courtesy of Energy Aware Committee.

Children take a ride on a double-decker bus. Courtesy of MELP.

Saanich Inlet forest, Vancouver Island. Stock photography.

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MESSAGE FROM THE MINISTER

Honourable Ian G. Waddell
Minister of Environment, Lands and Parks

November 8, 2000

Robert A. Flemington, President
Canada's Climate Change
Voluntary Challenge and Registry Inc.
600-170 Laurier Ave W
Ottawa ON K1P 5V5

Dear Robert Flemington:

I am pleased to submit the British Columbia Government's Action Plan on Climate Change to Canada's Voluntary Challenge and Registry (VCR) Inc. This Action Plan sets out the BC government's commitment to reducing greenhouse gas emissions from its own operations by 16% between 2000 and 2005.

At the October 2000 meeting of Ministers of Environment and Energy, British Columbia released its first Climate Change Business Plan. The plan contains detailed commitments in key areas including transportation, energy and industry, communities and buildings, forests and agriculture and other supporting actions.

A central element of BC's overall business plan is a commitment to increase the sustainability of our own operations through a Green Government initiative. To meet this commitment, we have prepared an inventory of greenhouse gas emissions from buildings and vehicles, established a target for emission reductions, and identified actions that will allow us to reach the target. We are putting in place systems to monitor our emissions and our progress, and a management structure to review and revise our strategy. We will also provide VCR Inc. with regular updates on our progress.

Taking action now to reduce greenhouse gas emissions is the right thing to do – for our environment, economy, and future generations. BC's Action Plan for government operations is a step in the right direction, and we are committed to its improvement in the coming years and to ongoing efforts to reduce our greenhouse gas emissions.

Sincerely,

EXECUTIVE SUMMARY

This 5 year action plan sets out the BC government's commitment to reduce greenhouse gas emissions resulting from its own operations. The action plan for government operations is a key element of BC's Climate Change Business Plan released October 16, 2000.

The BC government commits to reduce its greenhouse gas emissions by 16% over the period 2000-2005, a reduction of 22,000 tonnes CO_2e, through a range of measures, including:

- reductions in emissions from the vehicle fleet, through vehicle choice, fuel switching, and reductions in vehicle kilometres travelled
- retrofits of government buildings
- green power procurement
- green procurement and environmental management systems

These actions are expected to reduce greenhouse gas emissions to 113,000 tonnes CO_2e per year by 2005, approximately 6% below what they were in 1990.

The government will also provide support to its employees to reduce emissions from commuting.

TEMPERATURE CHANGE IN BC 1895–1995

The province's "ecoregions" have warmed by up to 1.7°C over the past century. *Source: MELP (2000)*

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BC government profile

The BC provincial government is one of BC's largest enterprises in operational terms. It employs approximately 38,000 civil servants across the Province, with around 11,000 located in the Capital Regional District on Southern Vancouver Island.

In 1999, greenhouse gas emissions from government buildings and vehicles (excluding Crown corporations) were estimated at 128,453 tonnes of carbon dioxide equivalent. This represents 0.2 percent of total emissions in the province of British Columbia.

The government of British Columbia is committed to a sustainable environment and economy. In 1999, the government created the Green Economy Initiative to:

- help B.C. businesses succeed in today's greener global economy,
- support B.C. communities in their transition towards a more sustainable economy and a cleaner environment, and
- motivate British Columbians to incorporate environmental values into their daily lives.

In October 2000, Premier Ujjal Dosanjh released BC's first Climate Change Business Plan. This plan, which can be found on the Ministry of Environment, Lands and Parks website at http://www.elp.gov.bc.ca/epd/epdpa/ar/climate/, sets out the government's commitment to take action to reduce emissions and prepare for future decisions on climate change policy. The plan includes more than 40 actions, and will involve 15 different government ministries and agencies in implementation.

Managing our response to climate change

An interdepartmental Assistant Deputy Minister (ADM) level committee was formed in 1999 to coordinate the provincial government's response to climate change. The committee includes representatives from 15 ministries and agencies. This committee directed the development of BC's climate change business plan, and oversaw the development of this government action plan. The ADMs committee is responsible for overseeing the implementation of the Climate Change Business Plan.

A Greening Government Steering Committee was also formed in 2000 to coordinate the development and implementation of this action plan. The Steering Committee, which reports to the ADMs committee, is comprised of representatives from the Green Economy Secretariat, the Ministry of Environment, Lands and Parks, the Ministry of Transportation and Highways, the Purchasing Commission (Ministry of Finance), BC Buildings Corporation, and the Crown Corporations Secretariat.

GREENHOUSE GAS EMISSIONS

The greenhouse gas emission sources from government operations are primarily related to energy use in government buildings and the operation of the government vehicle fleet. Appendix 1 is a summary of greenhouse gas emissions from government operations.

For the purpose of this report, British Columbia Government Fleet (the "Fleet") is defined to include all core ministry working vehicles as well as vehicles operated by the British Columbia Ambulance Service. Vehicles operated by Crown Corporations are excluded. In addition to government fleet vehicles, emissions from personal vehicles used for government business and short-term rental vehicles are included.

Only British Columbia Buildings Corporation (BCBC) buildings used for central government operations are included in this inventory of greenhouse gas emissions. The operations of Crown Corporations, schools, hospitals and other similar institutions are excluded from this Action Plan.

Crown corporation vehicles, buildings and other activities represent significant sources of greenhouse gas emissions in BC. While emissions from Crown operations (except for ministry buildings owned or leased by BCBC) are not included in this action plan, some Crowns (e.g., BC Hydro) already report separately to the VCR, and other major Crowns will be requested to develop their own VCR action plans.

British Columbia government vehicle fleet emissions

Estimates of greenhouse gas emissions from ministry vehicles were developed using data from a number of sources, including:

- actual fuel use (available only for 1997-1999),
- vehicle kilometres traveled (VKT), and
- average vehicle fuel efficiency data.

Estimates of emissions from reimbursed employee travel using personal vehicles and annual daily rentals are also included in the inventory. These are estimated from actual kilometres travelled and the average emission intensity of gasoline cars and light trucks (tonnes of CO_2e/VKT).

1990 GHG emissions

Emissions from the Fleet accounted for about 0.09% of total provincial GHG emissions in 1990.

The 1990 baseline emissions for cars and light trucks are established using actual 1990 odometer data (VKTs) and the estimated average fuel economy of the vehicles that made up the 1990 fleet. In the absence of similar 1990 data for medium and heavy trucks, 1990 emissions for these vehicles was derived by "backcasting" using the actual 1999 fuel consumption data for medium and heavy trucks and the average growth rate of government between 1990 and 1999 (i.e. 1.06%/year).

VKT data from reimbursed employee travel using personal vehicles and rentals is not available for 1990. An estimate of 1990 emissions from these sources was prepared by backcasting from the 1999 estimate (see below) using the average growth rate of government between 1990 and 1999.

1999 GHG emissions

Detailed fuel consumption data are available by vehicle type and fuel type for the fleet use in 1999. Fleet greenhouse gas emissions are estimated using total fuel consumption, vehicle type and emissions factors by fuel type from the Voluntary Challenge and Registry Registration Guideline 1999.

Greenhouse gas emissions from reimbursed employee travel and short-term rentals were based on vehicle kilometres traveled and average emission intensity of gasoline cars and light trucks. In 1999, reimbursed personal vehicle travel was estimated at 38 million VKT, and rentals at 4.8 million VKT.

Emissions from employee commuting

There are about 38,000 provincial government employees in British Columbia. Access to alternative transportation options varies across the province with public transit an option in most major centres and cycling a year round option in southwestern British Columbia. Emissions from commuting employees are not included in the government's current greenhouse gas inventory.

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Fuel use and greenhouse gas emission data are presented below:

Table 1
FUEL USE BY FUEL TYPE
(litres)

Year	Vehicle	Aviation	CNG	Diesel	Gasoline	Propane	Total
1990	Government	22,808	5,445	2,125,145	12,987,819	318,910	15,460,127
	Personal/Rental				3,910,341		3,910,341
	Total Fleet						**19,370,468**
1999	Government	25,344	5,736	2,390,990	12,369,756	315,919	15,107,745
	Personal/Rental				4,175,610		4,175,610
	Total Fleet						**19,283,355**

Table 2
GREENHOUSE GAS EMISSIONS BY GAS TYPE
(tonnes – CO_2e)

Year	Vehicle Source	Carbon Dioxide	Methane	Nitrous Oxide	Total
1990	Government	36,994	76	649	37,719
	Personal/Rental	9,228	21	255	9,504
	Total Fleet	**46,222**	**97**	**904**	**47,223**
1999	Government	36,262	75	568	36,905
	Personal/Rental	9,854	22	272	10,148
	Total Fleet	**46,116**	**97**	**840**	**47,053**

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British Columbia government buildings

In 1990 BCBC owned or leased 1,804,626 m^2 of space for government operations. Detailed energy use data were available for 1990 for a subset (985,044 m^2) of the total space. An estimate of energy consumption for the entire building inventory was prepared by applying the energy use per m^2 factors from the subset to the remainder of the buildings. Estimates of greenhouse gas emissions were prepared by applying emissions factors by fuel type from the Voluntary Challenge and Registry Registration Guideline 1999 to the fuel use estimates. By far the dominant greenhouse gas emission from building energy use is CO_2; however, methane and nitrous oxide emissions are also included in the inventory.

Emission factors for electricity use were drawn from BC Hydro's September 2000 Climate Change Progress report to the VCR. The average emission intensity of electricity generated by BC Hydro is very low (30 tonnes CO_2e/GWh) compared to the average of Canadian utilities (200 tonnes CO_2e/GWh) or to average U.S. utilities (650 tonnes CO_2e/GWh). However, the emission intensity of the BC Hydro system varies considerable from year to year due to changes in water availability and fossil fuel generation. Because 1990 emissions were unusually low (a high water year) an average of 1989 to 1993 emission factors was used to estimate 1990 emissions from electricity used in buildings.

Table 3
1990 BUILDING EMISSIONS

Energy Type	Energy (GJ)	Greenhouse Gas Emissions (tonnes CO_2e)
Gas	907,320	46,273
Diesel (#1	306	24
Heating oil (#2)	141,440	10,891
Heating oil (#5)	8,510	3,735
Steam	26,775	888
Propane	54,590	3,412
Electricity	796,904	6,862
Total	**1,975,845**	**72,085**

Greenhouse gas emissions for 1999 were calculated in the same manner as 1990. Detailed data were available for 941,560 m^2 of the total 2,045,001 m^2 of buildings, and the same energy use pattern was assumed to apply to the entire inventory.

Table 4
1999 BUILDING EMISSIONS

Energy Type	Energy (GJ)	Greenhouse Gas Emissions (tonnes CO_2e)
Gas	1,340,317	68,356
Diesel (#1)	–	–
Heating oil (#2)	9,014	694
Heating oil (#5)	–	–
Steam	15,693	520
Propane	55,148	3,447
Electricity	1,160,697	8,383
Total	**2,580,869**	**81,400**

The main factors affecting emissions growth have been the increase in floor space since 1990 and changes to the electricity emission factor. Floor space has increased as government services have expanded to meet the needs of a growing population. Electricity emission factors have fluctuated considerably from year to year. Solely as a result of changes to emission factors, emissions from government buildings are expected to increase to 87,849 tonnes in 2000.

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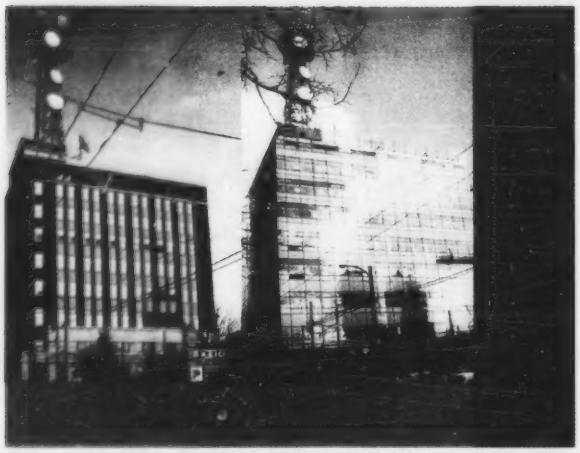


Vancouver Telus Building before and after retrofit with high-tech skin and operable windows. Courtesy of BC Buildings Corporation.

BC government buildings

Estimates of future emissions are sensitive to the assumptions about:

- the rate of growth in the building stock used in government operations, and
- the GHG intensity of new and existing building stock over time.

GHG intensity, in turn, is dependent on assumptions about the average energy intensity and fuel mix of buildings, and the emission intensity of different fuels.

The projected emissions were based on the following assumptions:

- No growth in building stock beyond 2000 and no turnover of existing stock
- In the absence of more detailed breakdown of the sources of energy efficiency improvements, a simple one-to-one correlation between reductions in energy intensity and reduction in GHG intensity.

In the absence of the measures described below, emissions from buildings would be expected to increase to 88,951 tonnes CO_2e by 2005. This increase reflects expected changes to electricity emissions as new, primarily thermal generation is brought on to meet load growth.

Vehicle fleet

Little growth is assumed in government operations from 2000 to 2005. As a result, under a business-as-usual projection, it was assumed that the following remain constant beyond 2000:

- Average VKTs for cars, light trucks, medium and trucks,
- Employee and rental VKTs,
- Average fuel economies of the fleet,
- The relative proportion of vehicles using each fuel type, and
- Average fuel consumption for other (off-road) equipment and aircraft.

In the absence of the measures described below, emissions would be expected to remain constant at about 47,000 tonnes per year.

EMISSIONS REDUCTION TARGET

The overall target of the government of British Columbia is to reduce emissions by 16% from 2000 to 2005. The emissions for 2000 are estimated at 134,902 tCO_2e/year while the emissions in 2005 will be 136,004 tCO_2e/year if business continues as usual. Our target is to reduce the emissions by 22,100 tCO_2e to 112,822 tCO_2e/year by 2005. If we are successful, we will have returned emissions to approximately 6% below 1990 levels, equivalent to the Canadian target under the Kyoto Protocol.

The key actions to achieve this target will be changes to the government fleet, buildings and source of electricity. The target is based on the current number of employees remaining stable from 2000 to 2005. Analysis of the extent to which we have reached our projected target will include any relative changes to the size of the BC government and the resulting impact on emissions.

Emissions from government procurement and employee commuting have not been included in the total baseline, nor in the projected reductions. However, the BC government has established strategies to reduce emissions in these areas and to determine the feasibility of including them in future calculations.

Target review and update

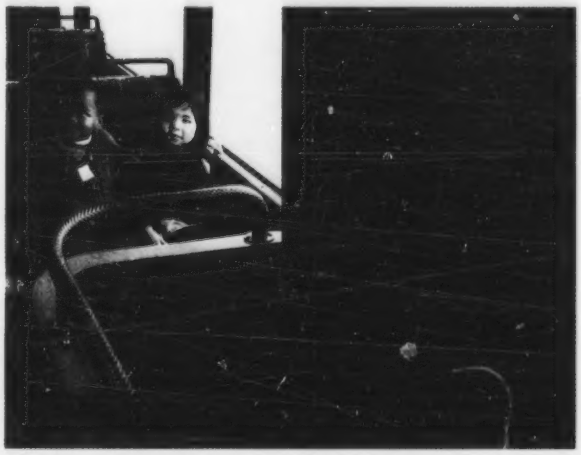
The target will be reviewed on March 31, 2001 and each subsequent year up to 2005. The review will include an analysis of the actions to date and the success in achieving a reduction in emissions. Targets for the fleet and buildings and an overall target will be identified for each of the years leading up to 2005 and will be submitted in BC's 2001 progress report. The potential to include impacts from the BC government that are currently not in our baseline inventory will be considered in the annual reviews.

In the 2004 report there will be a target for 2010 emission reductions based on the actual emission reduction forecast for 2005 and the feasibility of actions required to achieve further reductions. The potential to include a broader inventory base will be considered for the 2010 target.

Review process

The review process will involve analysis on a quarterly basis by the Greening Government Steering Committee. This committee will draw from progress to date status reports from the various Greening Government initiatives to identify any necessary revisions to actions as well as identify any new areas that could be included within the baseline inventory. The recommendations of this committee will go to the ADMs committee on Climate Change for approval.

Within the third quarter of each year the recommendations approved by the ADMs committee on Climate Change will proceed to the relevant Deputy Ministers for approval. If there are substantial changes these will then be presented to the Ministers of Environment and Energy and, if necessary, Cabinet for final approval.



Children take a ride on a double-decker bus. Courtesy of MELP.

Vehicle fleet

The reduction in emissions from the government fleet involves four activities. Each ministry will determine the specific actions that correspond best to their operational requirements.

1. **VKT reduction policy:** Achieved through a bundle of measures to enhance teleconferencing, ride sharing, mode shifting, and optimization of travel planning (schedules and routes).
2. **Alternative fuel vehicle (AFV) and hybrid vehicle leasing:** Substituting conventional fueled vehicles for compressed natural gas (CNG), propane-fueled vehicles, or hybrid vehicles in government lease arrangements.
3. **Vehicle-switching:** Where possible, substituting SUVs with lighter fleet vehicles where intended use or function is not compromised.
4. **Use ethanol blends of gasoline:** Using 10% ethanol blends (E10) in a portion of the government fleet.

Supporting actions within this initiative will include:

- Development of a five year strategy and specific targets for each of the ministries;
- Development of a policy framework to support ministries in achieving their targets.

This program is anticipated to achieve reductions of approximately 7,600 tCO_2e/year or 16% reduction from current emissions, equivalent to a 2005 fleet comprised of 100% alternative fuel vehicles. This target is based on the proposed actions identified above. Substantial changes in the type of vehicles leased are required in order to achieve the target and thus, the full support of the ministries impacted is required to achieve the target.

Building retrofits

British Columbia Building Corporation (BCBC) is responsible for the majority of buildings occupied by ministry staff. Two-thirds of these buildings are owned and 1/3 is leased. BCBC is committed to energy efficiency measures in those buildings that they own by 2005. BCBC is also committed to pursuing similar measures with their leased buildings.

Under this program a package of cost-effective lighting retrofits and improved building energy management programs will be undertaken in existing BCBC buildings. This package of retrofit/management measures is expected to achieve an average of 10% reduction in energy consumption.

This program is anticipated to achieve reductions of approximately 12,000 tCO_2e/year from estimated year 2000 emissions. These targets are based on energy efficiency measures of existing buildings owned by BCBC. There is the potential for further reductions through implementation of energy efficiency measures in leased buildings.

Green power procurement

The provincial government will increase the use of photovoltaics and other renewable energy sources in provincial parks. This initiative involves the purchase of photovoltaics in parks for 2000/01, achieving small but important reductions.

In addition, the province has initiated discussions with BC power producers to acquire green power for a portion of government facilities. Identification of the process for acquiring green power for government facilities within the current regulated context will occur in 2000/01 and be implemented in 2001. There is a policy and financial commitment to acquire the green power by the provincial government for the next three years. The program will then be re-evaluated.

It is estimated that there will be a reduction of approximately 2,000 tCO_2e/year as a result of these proposed actions. Combined with the reductions from the retrofit program this will result in a total estimated reduction emissions from buildings of 16% in buildings between 2000 and 2005.

Green procurement

Approximate annual purchasing responsibility for goods and services within the BC Government (including BCBC, but excluding other Crown Corporations) totals $2.15 billion:

Ministries	$1,520 million
BCBC	$150 million
Government Services and Registries	$475 million

The British Columbia government has set a target of "green screening" 75% of all government purchases by 2005. The 2000/01 actions to achieve this target include:

- The establishment of a green lens process that will incorporate environmental impact into the decision making process of procurement
- The development of a process for identifying product/ supplier standards.
- The establishment of an integrated Environmental Management System throughout government based on outcome-oriented performance measures to encourage ministries to seek an optimal mix of strategies for reducing environmental impacts.
- The development of a green pages document to assist in identifying sources for green products.

The greenhouse gas impacts of these measures are not known at this time. In order to assess the current emissions and the potential reductions from the preceding actions a baseline inventory will be carried out.

Employee commuting

Building on the success of the provincial government's employee commuting program the British Columbia government is establishing a role within government to:

- survey employees to determine current commuting patterns;
- develop a program of education and incentives to encourage cycling, transit and carpooling and discourage Single Occupancy Vehicle commuting; and
- continue to expand the opportunities for employees to take advantage of flexible hours and telecommuting, thus reducing the impact of commuting.

The survey will be used to assess the current emissions and the potential reductions to those emissions through the preceding actions.

Surrey Central Station linking SkyTrain with bus network. Courtesy of BC Transit.

Ballard fuel cell-powered bus operated by TransLink. Courtesy of Ballard Power Systems.

A major new initiative introduced in 1999 was a commitment by the Ministry of Transportation and Highways to shift 100 percent of its vehicle fleet to alternative fuels. To date approximately one-quarter of ministry vehicles have been replaced with natural gas or propane vehicles, resulting in an estimated annual reduction of 250 tonnes of CO_2e. The results of this project will be monitored closely to ensure that the estimates are verifiable.

In 2000, the Ministry of Environment, Lands and Parks agreed to fund an offset project, purchasing emission reductions from a solar heating project at the Lillooet Recreation Centre. The Ministry is currently bringing the project through the Greenhouse Gas Emission Reduction Trading (GERT) Pilot for review. While the emission reductions are very small, in the area of 20 tonnes/year, the ministry specifically undertook this investment to test the applicability of emission trading to small projects. The reductions from the project are fully documented and verifiable as part of the GERT review process.

BC Hydro employee at wind monitoring tower in Alert Bay. Courtesy of BC Hydro.

Public education and outreach

In October 2000, the provincial government released its first three-year business plan under Canada's national implementation strategy. A key element of the business plan is a Public education and outreach initiative. Through this initiative the province will establish a partnership with the federal and local governments, industry, and environmental groups to coordinate and facilitate climate change PEO activities over the next three years. Initial activities will include:

- Support for PEO partners – MELP will continue to provide technical advice and support to federally funded projects, including the Canadian Climate Change Calculator, the BC Energy Aware Committee, BC Transit's Travel Options Program, and the Off Ramp Program operated by Better Environmentally Sound Transportation (B.E.S.T.).
- Knowledge Network TV series – A television series and supporting videos will be completed in early 2001 on the topic of climate change science and BC-specific issues.
- School projects – A support network will be created for social studies teachers using climate change as a teaching theme and identifying curriculum linkages, teaching resources, training opportunities, and action programs for schools.
- BC Clean Air Day – The province will continue to work with its many partners on this annual June event to profile climate change issues and solutions.
- Public education materials – The government's existing materials will be updated and new products will be developed on an as-needed basis through 2002/03.

Information for employees

The government has provided information on climate change to employees and supported their efforts to reduce emissions through annual events such as Clean Air Day and Bike to Work Week. These activities will be built upon through a new initiative to support employee commuting practices that reduce emissions.

Students and parents involved in Way to Go! program operated by the Insurance Corporation of BC and Autoplan Brokers RoadSense Team enjoy their walk to school. Courtesy of Way to Go!

Our stakeholders

Working with stakeholders is critical to our response to the risk of climate change. In early 1997, the government established the BC Greenhouse Gas Forum, a multi-stakeholder advisory group that includes representatives from industry, business, environmental and public interest groups, labour and local government. This advisory group, one of the longest standing in Canada, provides consensus recommendations on climate change policy to the Ministers of Environment, Lands and Parks, and Energy and Mines. The reports of the Forum can be found on the Ministry of Environment, Lands and Parks website at: http://www.elp.gov.bc.ca/epd/epdpa/ar/climate/

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Appendix I
SUMMARY OF GREENHOUSE GAS EMISSIONS FROM GOVERNMENT OPERATIONS
(tonnes CO_2e)

Year	Source	Carbon Dioxide	Methane	Nitrous Oxide	Total CO_2e
1990	Fleet	46,222	97	904	47,223
	Buildings	72,085	–	–	72,085
	1990 Total	**118,307**	**97**	**904**	**119,308**
1999	Fleet	46,116	97	840	47,053
	Buildings	81,400	–	–	81,400
	1999 Total	**127,516**	**97**	**840**	**128,453**

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